requirement that the Abstract not exceed 150 words. In the event that the present replacement Abstract is itself found not to be of proper form, the Examiner is herein authorized to amend to a suitable replacement Abstract.

PROPOSED DRAWING CORRECTION

Attached hereto are two (2) sheets of drawings for Figures 4F and 16F showing proposed corrections thereto in red ink. Applicant respectfully requests approval and entry of the proposed drawing changes, and will submit formal drawings incorporating the proposed corrections upon an indication of allowable subject matter in the present application.

OK

PENDING CLAIMS

Claims 1-10 were pending in the application at the time of the Office Action. Unrelated to any rejection, appropriate Claims have been amended and added in order to adjust a clarity and/or focus of Applicant's claimed invention. That is, the amendments to the claims are unrelated to any prior art or scope adjustment, and are simply clarified claims in which Applicant is presently interested. At entry of this paper, Claims 1-21 are pending in the application for consideration and examination.

INFORMATION DISCLOSURE STATEMENT

Item 1 on page 2 of the Action indicates that the references listed in the application have not been considered. Submitted concurrently herewith is an Information Disclosure Statement with Form PTO-1449 and copies of the information listed therein.

OK

OBJECTION TO THE SPECIFICATION

The disclosure was objected to for the concern listed at Item 2 on page 2 of the Office Action. Applicant has amended the specification where indicated, and respectfully submits that such amendment fully addresses the concern listed in the Action. Reconsideration and withdrawal of the objection to the specification are respectfully requested.

OBJECTION TO THE CLAIMS-CLAIMS AMENDED

Claims 2-4, 6, 8 and 9 were objected to for the concerns listed at Item 3 spanning pages 2 and 3 of the Detailed Action. Unrelated to any prior art, scope or rejection, Claims 2-4, 6, 8 and 9 have been amended to clarify Applicant's invention. In view of the foregoing, it is believed that all concerns listed at Item 3 of the Action have been fully addressed, and reconsideration and withdrawal of the objection to Claims 2-4, 6, 8 and 9 are respectfully requested.

REJECTIONS UNDER 35 USC §§102/103 - TRAVERSED

All 35 USC rejections (*i.e.*, the 35 USC §102(b) rejection of Claims 1-4 as being anticipated by Suzuki (US 5,727,915); and the 35 USC §103(a) rejection of Claims 5-10 as being unpatentable over Suzuki in view of Shofner (US 6,300,631 B1) are respectfully traversed.

All descriptions of Applicant's disclosed and claimed invention, and all descriptions and rebuttal arguments regarding the applied prior art, as previously submitted by Applicant in any form, are repeated and incorporated herein by

reference. Further, all Office Action statements regarding the prior art rejections are respectfully traversed.

In order to properly support a §102 anticipatory-type rejection, any applied art reference must disclose each and every limitation of the rejected claim. In order to support a §103 obviousness-type rejection, the reference must not only suggest the claimed features, but also must contain the motivation for modifying the art to arrive at an approximation of the claimed features. The cited and applied art does not adequately support either a §102 anticipatory-type or a §103 obviousness-type rejection because, at minimum, such applied art does not disclose (or suggest) the following limitations of Applicant's claims.

Regarding Claims 1-6 and 11-21, Applicant's disclosed and claimed invention is directed toward electric conductivity beam arrangements (*e.g.*, apparatus, methods, etc.) used for separating and extracting minute micro-samples from specimen substrates within a vacuum space. As one important feature which is believed to be unique and novel over the applied references, Applicant's disclosed and claimed invention utilizes branch beams (*i.e.*, tweezer fingers) which are separated from each other by a distance which is smaller than a thickness of a minute micro-sample to be held between the branch beams. With such an arrangement, simplicity of operation is achieved in that the branch beams can be placed into contact with the micro-sample and forced onto such micro-sample such that a resiliency force of the distorted branch beams holds the minute micro-sample.

As a further unique and novel feature, note that added Claims 18-21 recite arrangements wherein the thickness of the minute micro-sample is taken into account in setting a width of a deep cut between the branch beams so that the

branch beams are separated from each other by a distance which is smaller than the thickness of the minute micro-sample. By forming the branch beams in this manner, the separation of the branch beams always can be customized to the thickness of a minute micro-sample which is expected to be extracted.

Turning now to rebuttal of the applied references, neither Suzuki nor Shofner disclose or suggest the above-discussed features/limitations of Applicant's Claims 1-7 and 11-21.

Regarding independent Claim 8, one important feature/limitation which is believed to distinguish such claim over the applied art is the further processing of the extracted minute micro-sample by further irradiation with the charged beam after the sample has been extracted from the original substrate.

Independent Claim 9 is believed to distinguish over the applied art of record by the holding of the minute micro-sample at a top of the electric conductivity branch beams formed at a top of the electric conductivity beam, where such arrangements are mounted obliquely above the specimen stage.

Independent Claim 10 is similar to independent Claim 9, with the further features/limitations that the arrangement is mounted within a range of from 15 degrees to 65 degrees relative to the specimen stage surface.

Furthermore, Applicant respectfully submits the following comments from Applicant's foreign representative in support of the patentability of Applicant's invention.

Although the Office Action contends that the invention described in Claims 1-4 is anticipated by Suzuki (US 5,727,915), the claimed invention is clearly distinct from this citation. Clarified Claims 1-4 are characterized by "branch beams (18)

being separated from each other by a distance which is smaller than that of a thickness of a minute micro-sample (25) to be held between said branch beams when said beam is moved in the direction (an arrow 26 in Fig. 4F) of the minute micro-sample and said branch beams are forcibly spread by the minute micro-sample so that the minute micro-sample is held by a resiliency force of said branch beams."

On the contrary, Suzuki needs to make an operation through "a joystick apparatus" and "a finger operating apparatus." Namely, an operator has to send control signals to the micro-gripper in order to open and close a pair of finger portions of the micro-gripper (refer to the Abstract in Suzuki).

In the present invention, an operator simply has to contact branch beams (18) to a minute micro-sample (25) to be held between the branch beams and to direct the beam to the direction (an arrow 26 in Fig. 4F) of the minute micro-sample (*i.e.*, force the beams onto the sample), so that the minute micro-sample is held by a resiliency force of said branch beams.

This simple structure and operation is not disclosed or suggested by Suzuki. Therefore, withdrawal of the rejection based on Suzuki in the outstanding Office Action is respectfully requested.

Furthermore, Applicant respectfully traverses the contention in the Office Action that the present invention as described in claims 5-10 is unpatentable over Suzuki in view of Shofner. All of clarified Claims 5-10 are characterized by the components described above. Moreover, branch beams (18) and beams (14) are specified to have electric conductivity. This removes some defects as described at

page 5, line 9 through page 7, line 16 of the specification (*e.g.*, "a second problem using a charged grass rod tip").

(3) On the other hand, Shofner discloses a method using a charged glass rod as described at Col. 2, lines 29-35 in the literature (cited reference 4 in the specification) entitled "Specimen Preparation for Transmission Electron Microscopy of Materials IV" on pages 19 to 27 of Material Research Society (MRS) Symposium Proceedings, vol. 480, L.A. Giannuzzi *et al.*, which discloses a Lift-Out method. The merits based on branch beams (18) and beams (14) are specified to an electric conductivity is not disclosed or suggested by Shofner. Therefore, Applicant respectfully submits that the rejection based on a combination of Suzuki in view of Shofner does not teach the invention as set forth in the clarified claims, and such rejection should be withdrawn.

As a result of all of the foregoing, it is respectfully submitted that the applied art would not support either a §102 anticipatory-type rejection or a §103 obviousness-type rejection of Applicant's claims. Accordingly, reconsideration and withdrawal of such §§102 and 103 rejections, and express written allowance of all of the rejected claims, are respectfully requested.

SPECIFIC TRAVERSAL OF OFFICIAL NOTICE

D.) NOT USE OFFICIAL NOTICE

Applicant respectfully traverses the comments in support of the art rejection under §103 at Item 5 spanning pages 5 and 6 of the Detailed Action, which assert that certain claimed features were well known in the art, *i.e.*, without providing supportive art references for such assertion. With regard to such assertion of apparent judicial (*i.e.*, Examiner) notice of common knowledge or well-known prior

art, attention is directed to MPEP §2144.03, which states, "If the applicant traverses such an assertion the examiner should cite a reference in support of his or her position." Accordingly, in view of Applicant's traversal in this regard, and in accordance with the provisions of MPEP §2144.03, Applicant respectfully requests that a documentary proof be cited to explicitly show that such features were explicitly known in the art, or alternatively, Applicant respectfully requests withdrawal of all rejections based upon such unsupported judicial notice. Further, at this point, it is respectfully submitted as a reminder that, if new art is now cited against any of Applicant's unamended claims, then it would not be proper to make a next Action final.

EXAMINER INVITED TO TELEPHONE

The Examiner is invited to telephone the undersigned at the local D.C. area telephone 703-312-6600, to discuss an Examiner's Amendment or other suggested action for accelerating prosecution and moving the present application to allowance.

MARKED VERSION TO SHOW CHANGES MADE

Attached hereto is "Appendix A-Marked Version" showing the amendments made herein to the claims by underlining and brackets to indicate additions and deletions, respectively.

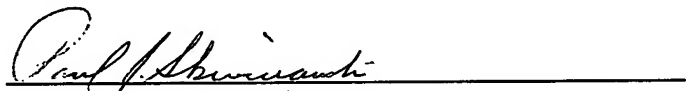
CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims listed above as presently being under consideration in the

application are in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

Attached hereto is a Form PTO-2038 authorizing payment of the requisite claim fee of $18 (Code 1202) and the filing fee of $180 (Code 1806) for the IDS under §1.97(c) submitted concurrently herewith. This Amendment is being filed within the shortened statutory period for response set by the Office Action, and therefore, no Petition or extension fee is required. To whatever other extent is actually appropriate, Applicant respectfully petitions the Commissioner for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including Petition and claims fees, to ATS&K Deposit Account No. 01-2135 (referencing Case No. 520.41238X00).

Respectfully submitted,



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ATTACHMENTS:
Appendix A-Marked Version
Clean (Clarified) Abstract
Two (2) Sheets Proposed Drawing
Corrections (Figs. 4F and 16F)
Form PTO-2038 (Fee Codes 1202/1806-$198)

CONCURRENT SUBMISSIONS:
Information Disclosure Statement
w/Form PTO-1449 and
Five (5) References

APPENDIX A-MARKED VERSION

IN THE SPECIFICATION:

Page 16, line 21 through page 17, line 18:

Then, a description will be given to the configuration, function, and the like of the beam used in the foregoing method. As described in the paragraph of the prior art, for holding the minute micro-sample by two independent movable beams in accordance with the prior art method, a high precision alignment operation of the movable beam tips is required. In addition, as described previously, unfavorably, the minute micro-sample is difficult to hold with reliability. In contrast, in the present invention, the alignment of the beam tip for holding the micro-sample is essentially unnecessary. Further, it is possible to hold the micro-sample with reliability. As a specific method, the micro-sample sandwiched in the beam tip, and thus extracted from the specimen substrate is inserted and held in the trench for insertion of the micro-sample disposed on the sample holder. Thus, the micro-sample is [pull] pulled out of and separated (detached) from the beam. The beam is a beam made up of a rod-like member having a shape in which its tip is formed thinner as compared with its root, and the tip is split into two units. By sandwiching and holding the micro-sample between the beam tip split into two units, the micro-sample is held through the elastic deformation force of the beam tip without using a piezoelectric element or the like.

Page 23, lines 16-20:

FIGS. 14H, and 14J to [10N] 14N are a schematic flow chart of steps for illustrating a specimen fabrication process by using a specimen fabrication equipment in accordance with a tenth example of the present invention;

IN THE CLAIMS:

1.(Once Amended) An electric conductivity [A] beam used for separating and extracting a minute micro-sample from a specimen substrate in vacuum space, [the] beam[,] comprising:

a plurality of branch beams [disposed] having an electric conductivity formed at a tip of [the] said beam[, the beam being configured such that the minute micro-sample to be separated and extracted is sandwiched and held between the plurality of the branch beams];

wherein said branch beams are separated from each other by a distance which is smaller than a thickness of a minute micro-sample to be held between said branch beams when said beam is moved in the direction of the minute micro-sample and said branch beams being forcibly spread by the minute micro-sample so that the minute micro-sample is held by a resiliency force of said branch beams.

2.(Once Amended) An electric conductivity [A] beam[, comprising: a first holding member; and a rod-like member exchangeably fitted with the first holding member, and having a shape portion in which its tip is formed thinner as compared with its root, and the tip is split into a plurality of units, the beam being configured such that a micro-sample is sandwiched and held in the split shape portion, and by extracting the sandwiched and held micro-sample from between the split shape

portion, the micro-sample can be detached and separated from the beam] according to claim 1;

wherein the minute micro-sample held between said branch beams is put on a sample holder for storing the micro-sample and said sample holder and said beam are moved relative to one another so that the minute micro-sample held between said branch beams is removed from said branch beams as the minute micro-sample being trapped by a part of said sample holder.

3.(Once Amended) An equipment for specimen fabrication, comprising:

[a microscope,]

a stage for mounting a specimen thereon[,];

a microscope for specifying a position to cut a minute micro-sample from the specimen and for monitoring operations of cutout of the minute micro-sample from the specimen;

a sample hold system having [a] an electric conductivity beam [in a tip-split shape, for press-fitting a minute micro-sample thereinto, and extracting the minute micro-sample from the specimen mounted on the stage], at a top of which a plurality of branch beams having an electric conductivity are formed; and

a control system for [transferring] controlling the position [of,] and [rotating the] rotation of said beam;

wherein said branch beams are separated from each other by a distance which is smaller than a thickness of the minute micro-sample to be held between said branch beams when said beam is moved in the direction of the minute micro-

sample and said branch beams being forcibly spread by the minute micro-sample so that the minute micro-sample is held by a resiliency force of said branch beams.

4.(Once Amended) An equipment for specimen fabrication, comprising:

[a microscope,]

a stage for mounting a specimen thereon[,];

a microscope for specifying a position to cut a minute micro-sample from the specimen and for monitoring operations of cutout of the minute micro-sample from the specimen;

a sample hold system having [a] an electric conductivity beam [in a tip-split shape, for press-fitting a minute micro-sample thereinto, and extracting the minute micro-sample from the specimen mounted on the stage], at a top of which a plurality of branch beams having an electric conductivity are formed;

a detector for detecting that [the beam] the top of said branch beams has come into contact with the minute micro-sample[,] which is cut out from the specimen; and

a driver for [transferring] moving the beam in the direction of the stage in a [prescribed] predetermined amount based on [a] the signal from the detector according to the detection of contact of the top of said branch beams and the minute micro-sample;

wherein said branch beams are separated from each other by a distance which is smaller than a thickness of the minute micro-sample to be held between said branch beams when said beam is moved in the direction of the minute micro-

sample and said branch beams being forcibly spread by the minute micro-sample so that the minute micro-sample is held by a resiliency force of said branch beams.

5.(Once Amended) The equipment for specimen fabrication according to claim 3 [or 4,];

wherein [particularly, the] said microscope is at least [any] one of an optical microscope, a scanning electron microscope, and a scanning ion microscope.

6.(Once Amended) A method for specimen fabrication, comprising [the steps of]:

mounting [the] a specimen on a stage;

[subjecting the specimen to cutting processing] cutting a minute micro-sample from said specimen;

[bringing a beam having a tip-split shape for extracting the processed specimen into contact with the processed micro-sample, for holding; and

separating the processed micro-sample from the specimen]

contacting a top of electric conductivity branch beams which are formed at a top of an electric conductivity beam to a part of the minute micro-sample cutout from the specimen;

detecting that the top of said branch beams has come into contact with the minute micro-sample;

moving the beam in the direction of the stage in a predetermined amount based on the signal from the detector according to the detection of contact of the top of said branch beams and the minute micro-sample; and

moving the beam in the reverse direction to the stage after the minute micro-sample is held by a resiliency force of said branch beams;

wherein said branch beams are separated from each other by a distance which is smaller than a thickness of the minute micro-sample to be held between said branch beams when said beam is moved in the direction of the minute micro-sample and said branch beams being forcibly spread by the minute micro-sample so that the minute micro-sample is held by the resiliency force of said branch beams.

7.(Once Amended) The method for specimen fabrication according to claim 6, [further] comprising [the steps of]:

transferring the minute micro-sample held by [the beam] said branch beams onto a [micro-]sample holder for mounting the minute micro-sample thereon;

[mounting or holding] storing the minute micro-sample on the [micro-]sample holder; and

[extracting the beam from the micro-sample, and separating the beam therefrom] moving said sample holder and said beam relative to one another so that the minute micro-sample held between said branch beams is removed from said branch beams and the minute micro-sample being trapped by a part of said sample holder.

8.(Once Amended) A method for specimen fabrication, comprising [the steps of]:

mounting a specimen substrate on a stage;

[subjecting the specimen substrate to cutting processing] cutting a minute micro-sample from said specimen;

[separating and extracting a micro-sample from the specimen substrate by using a beam having a tip-split shape] holding the minute micro-sample at the top of electric conductivity branch beams which are formed at a top of an electric conductivity beams;

extracting the minute micro-sample held by a restoring force of said branch beams from the specimen;

processing [the] an extracted minute micro-sample [through] by an irradiation with a charged beam; and

storing [the] a processed minute micro-sample [in] on a mounting holder on the specimen stage.

9.(Once Amended) An equipment for specimen fabrication, comprising:

a charged particle beam source;

an optical means for converging a charged particle beam from the charged particle beam source;

a specimen stage for mounting a specimen to be irradiated with the converged beam; and

a sample hold system having a system [rotating with the tip split,] holding a minute micro-sample at a top of electric conductivity branch beams which are formed at a top of an electric conductivity beams mounted obliquely above the specimen stage.

10.(Once Amended) An equipment for specimen fabrication, comprising:

an ion beam source;

an objective lens for irradiating [a] an ion beam from the ion beam source to a specimen;

a specimen stage for mounting the specimen thereon; and

[a conical metal beam with its tip split, for handling a micro-sample within a range of from 15 degrees to 65 degrees relative to the specimen stage surface] a sample hold system having a system holding a minute micro-sample at a top of electric conductivity branch beams which are formed at a top of an electric conductivity beams and mounted within a range of from 15 degrees to 65 degrees relative to the specimen stage surface.

IN THE ABSTRACT:

There are disclosed a method for fabricating (processing) a micro-sample used for the observation, analysis, and measurement by, for example, a transmission electron microscope (TEM), and an equipment for specimen fabrication (processing) used for carrying out the method. With the method for specimen fabrication (processing) of the present invention, a micro-sample to be separated and extracted from a specimen substrate is sandwiched and held between a plurality of branch beams formed at the tip of a beam. The beam holding the micro-sample is transferred onto a sample holder, and the micro-sample is mounted (firmly held) on the sample holder. After mounting the micro-sample on the sample holder, the beam is detached and separated from the mounted micro-sample. By adopting such a method [for separating, extracting, and mounting the micro-sample], it is

possible [to separate and extract the minute micro-sample from a desired region on the specimen substrate with precision and stability, and] to fabricate a specimen for high reliability observation, analysis, and measurement entailing less contamination, in a shorter time and with efficiency.